2006 REGIONAL TRANSPORTATION IMPROVEMENT PROGRAM (RTIP)

PERFORMANCE MEASURES EVALUATION

2006 REGIONAL TRANSPORTATION IMPROVEMENT PROGRAM (RTIP)

PERFORMANCE MEASURE ANALYSIS

SYSTEM WIDE ANALYSIS AND PROJECT LEVEL ANALYSIS FOR:

I-580 HOV LANES - ALAMEDA
CALDECOTT TUNNEL - CONTRA COSTA
U.S. 101 NOVATO NARROWS - MARIN & SONOMA
I-680/80 INTERCHANGE - SOLANO

Performance Measure Evaluation of the 2006 RTIP Submittal

The California Transportation Commission, at the request of the Business, Transportation, and Housing Agency, is requiring Performance Measure Analysis data as part of the 2006 State Transportation Improvement Program. Regions are required to submit a program level analysis and a pilot analysis of several projects.

MTC views the RTIP as one piece of what is necessarily a larger investment plan designed to meet the region's overall transportation goals. The region's long range transportation plan is the comprehensive investment plan designed to achieve its adopted goals through state, federal, and local funds anticipated over a 25-year period. Because the RTIP is a key step in implementing the overall investment plan, the performance evaluation of the 2006 RTIP is based on the goals and performance analysis of *Transportation 2030*, the adopted regional transportation plan at the time of this submittal.

***Transportation 2030*, including a comprehensive Project Performance Evaluation Technical Report, can be accessed at: http://www.mtc.ca.gov/planning/2030_plan/index.htm, or is available from MTC upon request.**

The system level analysis demonstrates the contribution of the 2006 RTIP as a whole toward each of six policy goals identified in the Transportation 2030 Plan:

- Safety
- Reliability
- Access
- Livable communities
- Clean air
- Efficient freight travel

*Note that individual projects can contribute to one or more policy goals.

With input from the CMAs, the projects listed below were selected for the pilot analysis based on future state funding needs and regional significance:

- I-580 HOV Lanes - Alameda
- Caldecott Tunnel - Contra Costa
- U.S. 101 Novato Narrows - Marin and Sonoma
- I-680/80 Interchange - Solano

Performance Evaluation of the 2006 RTIP

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Introduction

This document demonstrates how the 2006 RTIP contributes toward the goals in the Bay Area's long-range transportation plan, Transportation 2030. The Transportation 2030 Plan is a comprehensive investment plan designed to achieve regional goals through the strategic investment of state, federal, and local funds anticipated over the next 25 years. The 2006 RTIP is one piece of this larger investment plan, which directs specialized funding sources to the maintenance, operations and expansion of the region's multi-modal transportation system.

The CTC, at the request of the Business, Transportation, and Housing Agency, is requiring Performance Measure Analysis data as part of the 2006 STIP. Regions are required to submit a program level analysis and a pilot analysis of several projects.

This report includes a system level analysis and a project level analysis for the 2006 RTIP investment program, described below.

System Level Analysis

The system level analysis demonstrates the contribution of the 2006 RTIP as a whole toward each of six policy goals identified in the Transportation 2030 Plan:

- Safety
- Reliability
- Access
- Livable communities
- Clean air
- Efficient freight travel

The performance analysis for each goal is presented in two parts.

Part 1 uses quantitative measures applied at the regional, modal or corridor level to assess current and future transportation system performance as a result of the entire Transportation 2030 investment program, of which the 2006 STIP is a key element.[1] The report uses the performance indicators and measures included in Table A referenced in Section 19 of the 2006 STIP Guidelines where these measures are appropriate and the data is available. (Table 1 summarizes the correspondence between the measures in Table A and the Transportation 2030 Goals.) The report presents some additional or alternative performance measures along with a discussion of the advantages and disadvantages of these measures compared to those referenced in the STIP Guidelines. The analysis also addresses those measures referenced in the STIP Guidelines that do not correspond with the Transportation 2030 Goals or for which the data and tool required are not available.

Part 2 addresses more specifically the contribution of the 2006 RTIP investment program to toward each of the Transportation 2030 goals. This is illustrated by the number and value of projects in the 2006 RTIP that are expected help meet each goal, along with a short list of specific project examples.

[1] Current performance is based on data available for year 2003, 2004 or 2005. Most of this data was collected for the report series Bay Area Transportation: State of the System. Measures of future system performance are based on year 2030 forecasting conducted for the Transportation 2030 Plan Environmental Impact Report and describe the impact of the financially constrained portion of the Transportation 2030 investment program.

Project Level Analysis

With input from the CMAs, the projects listed below were selected for the pilot analysis based on future state funding needs and regional significance:

1. I-580 HOV Lanes - Alameda County Congestion Management Agency
2. Caldecott Tunnel – Contra Costa Transportation Authority
3. U.S. 101 Novato Narrows - Transportation Agency of Marin & Sonoma County Transportation Authority
4. I-680/80 Interchange – Solano Transportation Authority

The project level analysis contains the following information:

A. Project name, total cost and RTIP share
   1) Applicable Caltrans indicators (grouped by RTP goals above)
   2) Available performance data using Caltrans measures
   3) Data quality and availability issues
   4) Possible alternative measures or qualitative assessment where indicators apply but data for measures is not available

Table 1: Correspondence Between Transportation 2030 Goals and Measures in Table A of the STIP Guidelines

Transportation 2030 Goal	Table A Indicator Category	Table A Measures	Additional/ Alternative Measures Reported
A Safe and Well Maintained System	Safety	▪ Fatalities/vehicle miles traveled ▪ Fatal collisions/ vehicle miles traveled ▪ Injury collisions/ vehicle miles traveled ▪ Fatalities/passenger miles	
	System Preservation	▪ Number and percentage of distressed lane miles ▪ Smoothness (percentage of roadway at IRI levels)	Pavement conditions of locally owned roads (by pavement condition index)
A Reliable Commute	Mobility	▪ Passenger hours of delay per year ▪ Average peak period and off-peak period travel time	Average travel time by trip purpose (work/non-work) and mode
	Accessibility	▪ Percentage of population within ¼ mile of transit	
	Reliability	▪ Travel time variability by corridor ▪ Percent of transit vehicles no more than 5 minutes late	Percent on-time performance for largest transit operators
	Productivity	▪ Transit passenger per revenue vehicle hour ▪ Transit passenger per revenue vehicle mile ▪ Passenger miles per train mile ▪ Average peak period and daily vehicle trips by corridor ▪ Average peak period and daily person throughput by corridor	
Efficient Freight Travel	Productivity (trucks)	▪ Number and percentage of average daily vehicle trips that are trucks by corridor	
Access to Mobility		▪ none	Number of jobs accessible from minority/low-income communities and the remainder of the Bay Area by auto and transit within 15, 30 and 45 minutes
Clean Air		▪ none	Emissions of criteria pollutants (tons/day)
Livable Communities		▪ none	Number and percentage of population within ¼ mile of transit
none	Return on Investment/ Lifecycle Costs	▪ none given	Benefit to cost ratio

System Level Analysis

RTP Goal: A Safe and Well-Maintained System

Part 1. Current and Future System Performance

		Current System Performance (year)	Future System Performance (2030)
Safety: Fatality and Collision Rates			
Table A Measures	Fatalities per million VMT	0.008 (2003)	not available
	Fatal collisions per million VMT	0.008 (2003)	not available
	Injury collisions per million VMT	0.575 (2003)	not available
	Transit fatalities per passenger mile	not available	not available
Sources:	California Highway Patrol SWITRS database for collisions; Highway Performance Monitoring System (HPMS) for VMT		
State of Repair			
Table A Measures	Distressed lane miles (state-owned highways only)		
	Total distressed lane miles	1,607 (2004)	not available
	Percent of lane miles that are distressed	27% (2004)	not available
	Smoothness (principal arterials and interstates only)		
	Percent of road miles rated good	4.4% (2004)	not available
	Percent of road miles rated fair	39.8% (2004)	not available
	Percent of road miles rated mediocre	32.3% (2004)	not available
	Percent of road miles rated poor	23.5% (2004)	not available
Sources:	Caltrans 2004 State of the Pavement Report for distressed lane miles; Highway Performance Monitoring System (HPMS) for smoothness		
Notes:	International roughness index (IRI) is an indicator of ride comfort or smoothness. Good: interstate IRI < 95; principal arterial IRI < 95 Fair: interstate IRI = 95 to 119; principal arterial IRI = 95 to 170 Mediocre: interstate IRI = 120 to 170; principal arterial IRI = 171 to 220 Poor: interstate IRI >171; principal arterial IRI > 221		
Additional/ Alternative Measures	Pavement conditions of locally owned roads		
	Percent of roadways in excellent or very good condition (PCI=75 to 100)	44% (2003)	not available
	Percent of roadways in good or fair condition (PCI=45 to 74)	35% (2003)	not available
	Percent of roadways in poor or very poor condition (PCI=0 to 44)	17% (2003)	not available
	Average PCI for local roadways (out of 100)	66 (2003)	not available
Sources:	Local road PCI - Metropolitan Transportation Commission, Bay Area Transportation State of the System Report 2004		
Notes:	PCI = pavement condition index. Percentages are based on 97 of 108 cities and counties reporting. Roads in excellent or very good condition have no distress and require mostly preventative maintenance. Roads in good or fair conditions offer acceptable ride quality though surfaces are becoming worn to the point where rehabilitation is needed to prevent rapid deterioration. Pavements in poor or very poor condition have extensive amounts of distress and require major rehabilitation or reconstruction.		

Since data is not available for these measures of safety and state of repair in the future, they do not facilitate a quantitative assessment of the Transportation 2030 investment program. The region's fix-it first policy does, however, recognize the importance of maintaining the system in a good state of repair. In accordance with state policy, Transportation 2030 focuses on flexible federal funding, rather than RTIP funding, to supplement local investment in local roadway and

transit system maintenance. Altogether, Transportation 2030 directs $10.6 billion toward an estimated $16.7 billion need for local roadway maintenance between 2005 and 2030. The State's 10-year SHOPP program would direct additional funding (not reflected in the long-range plan) for the maintenance and rehabilitation of state-owned roadways.

Discussion of Data Availability and Quality and of Alternative/Additional Measures

Collision Rates

Fatalities, fatal and injury collisions per million VTM. MTC does not currently forecast future collisions or collision rates for roadways or transit. Some work has been done nationally to quantify reductions in roadway collision rates associated with various types of operational and capital investments; however, MTC staff will need to review this work before deciding whether and how to apply it.

Transit fatalities per passenger miles. In 2003 FTA revised reporting procedures for transit safety and security. To date, FTA has not published data gathered under the new reporting system.

State of Repair

Distressed lane miles and smoothness. Reliable data for distressed lane miles is available for state-owned highways only (approximately 6,000 lane miles). Data for measures of smoothness, based on the international roughness index (IRI) reported in the highway performance monitoring system (HPMS), are available for interstates and principal arterials only (approximately 1,850 centerline miles).

Because these two measures leave significant gaps in information on locally-owned roads, MTC presents supplementary measures of local roadway state of repair based on pavement condition index (PCI). PCI, which measures cracks and wear rather than smoothness, is the measure used in MTC's Street Saver pavement management software used by most local Bay Area jurisdictions. The PCI-based measure offers extensive coverage of local Bay Area roads; in 2004, MTC gathered PCI data for 18,200 of 19,000 centerline road miles. The PCI-based measure may not be as useful in other parts of the state where different pavement management systems are used.

MTC does forecast roadway state of repair measures for the future.

Part 2. 2006 RTIP Contribution

The Bay Area's 2006 RTIP contributes to the regional goal of a safe and well maintained system as follows:

1. The RTIP submittal contains 4 safety projects for a total of $20.9 million. (4% of total funds proposed for programming).

Examples:

TIP ID#	Implementing Agency	Description	Total ($1,000)	RTP ID#
ALA030012	Alameda Co.	Vasco Road Safety Improvements	$3,900	98198
NAP010001	Caltrans	SR 12/29/221 Soscol Interchange	$4,200	94073
SF010020	SF DPT	Addison and Digby Traffic Circles	$200	21503
SM010002	Caltrans	SR 92 Shoulder Widening and Curve Correction – Pilarcitos Creek	$11,636	21893

2. The RTIP submittal contains 4 projects intended to preserve or improve the system's state of repair for a total of $17.9 million. (3% of total funds proposed for programming).

Examples:

TIP ID#	Implementing Agency	Description	Total ($1,000)	RTP ID#
NEW	BART	Alameda County Stations Renovation	$3,248	94525
ALA030001	AC Transit	Bus Component Rehabilitation	$5,500	21137

RTP Goal: A Reliable Commute

Part 1. Current and Future System Performance

Mobility

		Current System Performance (2000)	Future System Performance (2030)	
			Transportation 2030 Performance	Compared to No Investment
Table A Measures	Passenger hours of delay per year (millions of hours)	142	387	10% decrease
	Average peak period travel time	see alternative measures below		
	Average non-peak period travel time	see alternative measures below		
Additional/ Alternative Measures	Average travel time for drive alone work trips (minutes)	25.3	27.2	0.6 minute decrease
	Average travel time for carpool work trips (minutes)	31.5	36.3	1.1 minute decrease
	Average travel time for transit work trips (minutes)	49.4	50.8	no change
	Average travel time for auto non-work trips (minutes)	15.4	15.7	0.1 minute decrease
	Average travel time for transit non-work trips (minutes)	33.6	32.6	no change

Source: MTC Transportation 2030 travel demand forecasts
Note: Delay is defined as time spent traveling below free flow speeds

Accessibility

Table A Measures	Percentage of population within ¼ mile of a rail station	7.2%	7.5%	no change
	Percentage of population within ¼ mile of a ferry terminal	0.1%	0.2%	no change

Source: Metropolitan Transportation Commission analysis

It is a testament to the tremendous growing demands on the system that passenger hours of delay and average travel time are expected to increase by 2030 even with investment of over $118 billion in the operation and expansion of the region's transportation system. The impact of the regional investment program is most readily apparent when comparing measures of performance in year 2030 for the Transportation 2030 Plan with a no investment scenario: the investment program is projected to decrease passenger hours of delay by 10%, reduce travel time for work auto trips by more than half a minute on average, and reduce travel time for work carpool trips by more than one minute on average.

The accessibility measures show a small increase from today to 2030 in the share of the region's population living within a quarter mile of rail and ferry terminals. This reflects ABAG's Projections 2003 land use assumptions, which are based on "smart growth" principles and focus a larger share of new growth in urban infill opportunity zones and around transit hubs. The measures show no difference between the No Investment scenario and Transportation 2030 but, in fact, the number of persons living within a quarter mile of rail would increase by about 4,000 in the Transportation 2030 Plan.

Reliability

		Current System Performance (year)	Future System Performance (2030) Transportation 2030 Performance	Future System Performance (2030) Compared to No Investment
Table A Measures	Travel time variability	Not available	Not available	
	Percentage of transit vehicles that arrive at their destination no more than 5 minutes late	see alternative measures below		
Source:	See section on reliability on page 13			
Note:	See section on reliability on page 13			
Additional/ Alternative Measures	Percent of transit vehicles on-time, largest Bay Area operators			
	AC Transit bus	56% (FY 03-04)	not available	
	BART rail	93% (FY 03-04)	not available	
	Caltrain rail	92% (FY 03-04)	not available	
	Golden Gate Transit bus	82% (FY 03-04)	not available	
	Muni electric trolley bus	72% (FY 03-04)	not available	
	Muni motor bus	69% (FY 03-04)	not available	
	Muni light rail	66% (FY 03-04)	not available	
	SamTrans bus	88% (FY 03-04)	not available	
	VTA bus	97% (FY 03-04)	not available	
	VTA light rail	96% (FY 03-04)	not available	
Sources:	Transit operators			
Notes:	On-time performance defined by operator as follows: **AC Transit** - Never early and no more than 5 minutes late **BART** - Less than 5 minutes late at scheduled terminal stations **Caltrain** - Train arrived at the end of the station within 5 minutes of scheduled time **Golden Gate Transit** - Less than 5 minutes late and 1 minute early **Muni** - No more than 4 minutes late or 1 minute early **SamTrans** - No more than 5 minutes late **VTA** - No more than 5 minutes late (bus); no more than 3 minutes late (light rail)			

Since data is not available to measure future system performance with respect to reliability, it is not possible to quantify the impact of the investment program on this element of system performance.

Productivity*

		Current System Performance (year)	Future System Performance (2030) Transportation 2030 Performance	Future System Performance (2030) Compared to No Investment
Table A Measures	Transit passengers per revenue vehicle hour			
	Light rail - all operators	70 (FY 02-03)	132	19% decrease
	Heavy rail – (BART and Caltrain)	424 (FY 02-03)	536	13% decrease
	Ferry - all operators	102 (FY 02-03)	171	25% decrease
	Bus - all operators	38 (FY 02-03)	44	7% decrease
	Transit passengers per revenue vehicle mile			
	Light rail - all operators	6.6 (FY 02-03)	11.3	20% decrease
	Heavy rail - (BART and Caltrain)	12.1 (FY 02-03)	15.9	21% decrease
	Ferry - all operators	5.5 (FY 02-03)	11.3	24% decrease
	Bus - all operators	3.3 (FY 02-03)	3.6	19% decrease
	Passenger miles per train mile			
	Capitol Corridor	86.3 (year not given)	not available	

Sources: MTC Statistical Summary of Bay Area Transit Operators for current data for all operators except Capitol Corridor
MTC Transit O&M Sketch Planning Model Analysis of Transportation 2030 forecasts for future data
Caltrans Transportation System Performance Measures Prototype Report (January 15, 2004) for Capitol Corridor

Note: For heavy rail, measured by passengers per revenue train mile or revenue train hour

Table A Measures	***I-580 Corridor (at SR 84)***	(FY 00-01)		
	Average AM peak period vehicle trips	18,800	26,300	4% increase
	Average daily vehicle trips	166,400	300,500	11% increase
	Average AM peak period person trips	25,380	35,505	4% increase
	Average daily person trips	224,640	405,675	11% increase
	I-680 Corridor (at SR 84)	(FY 02-03)		
	Average AM peak period vehicle trips	16,700	21,700	2% decrease
	Average daily vehicle trips	120,300	215,900	3% increase
	Average AM peak period person trips	22,545	29,295	2% decrease
	Average daily person trips	162,405	291,465	3% increase
	I-80 Corridor (at N. Texas St.)	(FY 02-03)		
	Average AM peak period vehicle trips	16,000	30,900	11% increase
	Average daily vehicle trips	166,000	290,000	2% increase
	Average AM peak period person trips	21,600	41,715	11% increase
	Average daily person trips	224,100	391,500	2% increase
	SR 24 Corridor (at the Caldecott Tunnel)	(FY 02-03)		
	Average AM peak period vehicle trips	23,700	26,600	3% increase
	Average daily vehicle trips	174,000	208,400	no change
	Average AM peak period person trips	31,995	35,910	3% increase
	Average daily person trips	234,900	281,340	no change

		Current System Performance (year)	Future System Performance (2030) Transportation 2030 Performance	Future System Performance (2030) Compared to No Investment
	Productivity cont.			
Table A Measures	***SR 4 Corridor (at Bailey Road)***	(FY 02-03)		
	Average AM peak period vehicle trips	15,700	18,900	4% increase
	Average daily vehicle trips	121,900	169,400	no change
	Average AM peak period person trips	21,195	25,515	4% increase
	Average daily person trips	164,565	228,690	no change
	US 101 Corridor - North Bay (at SR 37 east)	(FY 03-04)		
	Average AM peak period vehicle trips	20,300	21,700	2% increase
	Average daily vehicle trips	157,600	174,200	3% increase
	Average AM peak period person trips	27,405	29,295	2% increase
	Average daily person trips	212,760	235,170	3% increase
	US 101 Corridor – Peninsula (at SR 237)	(FY 00-01)		
	Average AM peak period vehicle trips	23,500	28,500	1% increase
	Average daily vehicle trips	182,600	262,000	no change
	Average AM peak period person trips	31,725	38,475	1% increase
	Average daily person trips	246,510	353,700	no change
	US 101 Corridor – Peninsula (at SR Third Street, San Mateo)	(FY 03-04)		
	Average AM peak period vehicle trips	31,700	32,900	no change
	Average daily vehicle trips	257,000	315,900	1% decrease
	Average AM peak period person trips	42,795	44,415	no change
	Average daily person trips	346,950	426,465	1% decrease
	SR 85 (at SR Winchester Blvd.)	(FY 03-04)		
	Average AM peak period vehicle trips	16,800	18,300	3% decrease
	Average daily vehicle trips	130,400	177,900	31% increase
	Average AM peak period person trips	22,680	24,705	3% decrease
	Average daily person trips	176,040	240,165	31% increase

Sources: Current year vehicle trips from San Francisco Bay Area State Highway System Observed Traffic Counts series
Future year vehicle trips from Transportation 2030 EIR forecasts

Notes: Average peak period person throughput is average peak period vehicles times average vehicle occupancy (AVO). Average daily person throughput is average daily vehicles times average vehicle occupancy (AVO). AVO = 1.35 for all calculations.

* Freight productivity measures reported below under the Transportation 2030 Goal, Efficient Freight Travel

The performance measures above suggest the productivity of the region's transit systems will increase considerably by 2030. This likely reflects the smart growth policies intended to direct growth around transit stations and to infill opportunities in transit-rich central cities and older suburbs.

Roadway productivity also will increase from today to 2030. The increase in throughput is greater for daily trips than for peak period trips in many corridors; with the peak period already highly congested, the growth in daily throughput reflect peak spreading and increases in off-peak travel.

Discussion of Data Availability and Quality and of Alternative/Additional Measures

Mobility

Passenger hours of delay and peak/off-peak period travel time. For reasons of data availability and consistency, MTC prefers to use forecast data for system-level mobility measures of delay and travel time. As a result, MTC presents travel time measures based on mode and trip purposes (work, non-work), which can be easily derived from travel demand forecasts, as an alternative to measures based on time of day (peak, off-peak periods).

Accessibility

Percentage of population within ¼ mile of rail station or bus route. MTC currently is not able to generate data on the number of persons living within ¼ mile of bus routes. We expect to develop this capability, which requires integrating data in our transit trip planning system with our GIS analysis system, in the next year. However, our measure does include persons living within ¼ mile of Bay Area ferry terminals, which are included in the region's transit oriented development strategy. Estimates are approximate, since measures for year 2030 rely on forecasts of future land uses as well as future population. Further, for consistency the estimates for 2000 and for year 2030 are based on land use patterns and population at the traffic analysis zone level. This approach provides less precision than using year 2000 land use and population at the census block level; however the year 2030 population and land use are not available at this level of detail.

Reliability

Travel time variability by corridor. Reliability data is not currently available for the entire freeway network. Loop detector coverage and reliability need to be improved. User interfaces with the data (e.g. PEMS) must be improved to address this measure at the corridor and system level.

Forecasting travel time variability is an emerging field. Some work has been done to estimate travel time variability as a function of congestion and to estimate improvements in reliability due to operations and system management projects. however, MTC staff will need to review of this work before deciding whether and how to apply it.

Transit reliability. Because Bay Area transit operators use different definitions of on-time performance, it is not possible to report the requested measure, percentage of transit vehicles that arrive at their destination no more than 5 minutes late. MTC presents alternative measures of on-time performance used by the major transit operators.

At this time, MTC does not have the ability to forecast future transit reliability.

Productivity

Transit passengers miles per train mile (intercity rail). Current data was compiled by Caltrans for the Transportation System Performance Measures Prototype Report (January 15, 2004). MTC does not forecast passenger miles, so this measure cannot be applied as an indicator of future system performance.

Average AM peak period and daily vehicle trips by corridor. These figures are based on throughput at selected screenlines within each corridor. Because Caltrans conducts vehicle counts on a rotating cycle, the current data at some locations is several years old.

Average AM Peak period and daily person trips. These figures are estimates generated by multiplying vehicle throughput times average vehicle occupancy. This is the best methodology available at this time.

Part 2. 2006 RTIP Contribution

The Bay Area's 2006 RTIP contributes to the regional goal of a safe and well maintained system as follows:

1. The RTIP submittal contains 56 projects, totaling $404.8 million, that aim primarily to **improve the commute by reducing peak period travel time (mobility) or increasing throughput (productivity).** (64% of total funds proposed for programming).

Examples:

TIP ID#	Implementing Agency	Description	Total ($1,000)	RTP ID#
MRN990001	Caltrans	US 101 HOV Lane Gap Closure in Marin	$9,700	94563
SCL991077	Caltrans	I-680 Sunol Grade Southbound HOV	$8,308	98141

2. The RTIP submittal contains 56 projects, totaling $404.8 million intended to **improve system reliability and/or increase throughput,** particularly during peak commute periods. (64% of total funds proposed for programming).

Examples:

TIP ID#	Implementing Agency	Description	Total ($1,000)	RTP ID#
NEW	Caltrans	El Camino Real Signal Coordination	$5,000	22274
NEW	Caltrans	San Mateo County wide Intelligent Transportation Systems (ITS)	$1,977	22274
SON010024	Caltrans	US 101 HOV Lanes in Sonoma County from Petaluma to Rohnert Park	$36,403	21904

3. The RTIP submittal contains 20 projects, totaling $157.4 million, intended to **improve accessibility to the transportation system, including transit.** (25% of total funds proposed for programming).

Examples:

TIP ID#	Implementing Agency	Description	Total ($1,000)	RTP ID#
ALA991081	Oakland	I-880 Acces at 42nd Ave/High Street	$4090	98162
CC030001	Richmond	Richmond Parkway Park and Ride Transit Access	$8,700	21208
SOL950035	Vallejo	Vallejo Ferry Terminal Parking	11,528	21817

RTP Goal: Efficient Freight Travel

Part 1. Current and Future System Performance

		Current System Performance (FY 2003-04)	Future System Performance (2030)	
			Transportation 2030 Performance	Compared to No Investment
	Productivity			
Table A Measures	Average daily vehicle truck trips (5+ axles)	not reported	not available	not available
	Percentage of average daily vehicle trips that are trucks (5+ axles)	not reported	not available	not available
Additional/ Alternative Measures	***I-580 Corridor (at SR 84)***			
	Average daily truck vehicle trips (4+ axles)	16,100	38,700	26% increase
	Above as share of average daily vehicle trips	10%	13%	2% increase
	I-880 Corridor (at Hegenberger Road)			
	Average daily truck vehicle trips (4+ axles)	10,000	13,100	3% increase
	Above as share of average daily vehicle trips	4%	5%	no change
	I-680 Corridor (at SR 84)			
	Average daily truck vehicle trips (4+ axles)	7,300	11,200	7% increase
	Above as share of average daily vehicle trips	5%	5%	no change
	SR 4 Corridor (at Bailey Road)			
	Average daily truck vehicle trips (4+ axles)	2,600	5,300	13% increase
	Above as share of average daily vehicle trips	2%	3%	1% increase
	US 101 Corridor – North Bay (at Old Redwood Hwy)			
	Average daily truck vehicle trips (4+ axles)	2,700	3,900	11% increase
	Above as share of average daily vehicle trips	3%	3%	no change
	US 101 Corridor - Peninsula (at SR 85/Bernal Rd, San Jose)			
	Average daily truck vehicle trips (4+ axles)	5,500	9,800	3% decrease
	Above as share of average daily vehicle trips	2%	4%	no change
	I-80 Corridor – Solano (at I-680 south)			
	Average daily truck vehicle trips (4+ axles)	7,800	11,800	19% increase
	Above as share of average daily vehicle trips	4%	4%	1% increase

Sources: Current truck volumes and truck shares from 2004 Caltrans truck counts
Future truck volumes from Transportation 2030 EIR forecasts

Notes: Future year truck forecast have been adjusted to reflect the fact that the model was not validated for 2000 large truck counts.
For 4+ axle truck trips as percent of average daily vehicle trips, future system performance compared to No Build is expressed in absolute change in share rather than percent change in share

The measures above indicate a significant increase between today and 2030 in the number of truck trips in all corridors shown. In many cases, the increase in truck trips appears to be in proportion to the increase in overall traffic. However, in major goods movement corridors including I-580, I-880 and US 101 on the Peninsula, the share of truck trips is forecasted to increase. For the most part, corridor truck throughput will increase with the Transportation 2030 investment program (compared to the No Investment alternative).

Discussion of Data Availability and Quality and of Alternative/Additional Measures

Average truck vehicle trips and truck share by corridor for trucks with 5 or more axles. While Caltrans reports current data for trucks with 5 or more axles, MTC's travel demand forecast do group 4-axle trucks together with trucks with 5 or more axles. For the sake of consistency, both current and future data are reported for trucks with 4 or more axles. When updating its models to the current system, MTC did not validate year 2000 forecasts of large truck volumes against actual counts. As a result, the future year estimates reported here represent adjustments (post-validation, if you will) to the truck volumes forecast in the Transportation 2030 EIR alternatives.

Part 2. 2006 RTIP Contribution

The Bay Area's 2006 RTIP contributes to the regional goal of efficient freight travel as follows:

1. The RTIP submittal contains 52 projects, totaling $366.8 million, that will **improve the ability of the system to move freight**. (58% of total funds proposed for programming).

Examples:

TIP ID#	Implementing Agency	Description	Total ($1,000)	RTP ID#
SCL010040	Caltrans	SR 152/156 Interchange Improvements	$6,140	21715
NEW	Vacaville	I-80/505 Weave Correction	$1,000	94153
ALA050011	ACCMA	I-580 Auxiliary and HOV Lanes	$25,000	21456

RTP Goal: Access to Mobility

Part 1. Current and Future System Performance

		Current System Performance (2000)	Future System Performance (2030)	
			Transportation 2030 Performance	Compared to No Investment
Additional/ Alternative Measures	Number of jobs accessible from minority and low-income communities			
	Within 15 minutes by auto	140,200	175,200	2% increase
	Within 30 minutes by auto	573,300	681,600	3% increase
	Within 45 minutes by auto	1,082,400	1,279,500	3% increase
	Within 15 minutes by transit	9,800	13,400	2% increase
	Within 30 minutes by transit	65,800	93,100	2% increase
	Within 45 minutes by transit	199,500	269,400	3% increase
	Number of jobs accessible from the remainder of the Bay Area			
	Within 15 minutes by auto	93,800	111,200	1% increase
	Within 30 minutes by auto	428,800	505,200	2% increase
	Within 45 minutes by auto	899,600	1,009,300	3% increase
	Within 15 minutes by transit	2,700	3,800	0% increase
	Within 30 minutes by transit	28,900	39,500	0% increase
	Within 45 minutes by transit	104,500	130,500	1% increase

Source: Transportation 2030 Plan Equity Analysis Report (November 2004)
Notes: Measures of year 2030 performance are based on the financially constrained alternative examined in the Transportation 2030 Draft Environmental Impact Report. This analysis, which was conducted prior to November 2004 does not reflect projects and investments included in local transportation funding measures approved by the voters in November 2004. As such, these indicators are a conservative measure of year 2030 performance

The measures above demonstrate that access to jobs is projected to increase in the future for persons living in minority and low-income communities as well as for persons living in other parts of the Bay Area. This likely due in part to smart growth policies intended to direct growth to infill opportunities in central cities and older suburbs, which often are located close to employment centers. When compared to the no investment alternative, the Transportation 2030 investment program would further improve access to jobs, increasing the number of jobs accessible from low-income and minority communities by 2 to 3 percent and increasing the number of jobs accessible from other parts of the Bay Area by a slightly smaller amount.

Discussion of Data Availability and Quality and of Alternative/Additional Measures

Access to jobs. Table A referenced in Section 19 of the STIP Guidelines does not list any performance measures addressing access to mobility as defined in Transportation 2030. The measures presented here, access to jobs and schools from low-income and minority communities and from the remainder of the Bay Area, are from the Transportation 2030 Equity Analysis. It is important to note that while jobs are generally associated with work opportunities, they also represent locations of goods and services including hospitals, retail outlets, government centers, etc. The equity analysis also included measures (not included

here) of access to other essential destinations such as schools, food stores, health services, social services, and banks and credit unions. Nonetheless, access to jobs represents just one aspect of the Access to Mobility goal. MTC continues to seek ways to measure other aspects of access to mobility, including access opportunities for older adults and disabled persons.

Part 2. 2006 RTIP Contribution

The Bay Area's 2006 RTIP contributes to the regional goal of access to mobility as follows:

1. The RTIP submittal contains 18 projects totaling $100 million that will **improve access to mobility for older adults, disabled, low income persons or school children**. (16% of total funds proposed for programming).

Examples:

TIP ID#	Implementing Agency	Description	Total ($1,000)	RTP ID#
NEW	MCTD	Novato Transit Hub	$3,000	21303
CC010029	Hercules	Hercules Intercity Rail Station	$4,000	21210

RTP Goal: Clean Air

Part 1. Current and Future System Performance

		Current System Performance (2000)	Future System Performance (2030)	
			Transportation 2030 Performance	Compared to No Investment
Additional/ Alternative Measures	Emissions Estimates for Criteria Pollutants			
	ROG (tons per day)	214.7	37.9	0.5% decrease
	NOx (tons per day)	363.4	55.4	0.2% decrease
	CO (tons per day)	2,279.6	295.6	0.6% decrease
	PM_{10} (tons per day)	93.9	127.9	0.2% decrease
	$PM_{2.5}$ (tons per day)	21.1	26.8	0.4% decrease

Sources: Transportation 2030 Environmental Impact Report

Notes:

These measures demonstrate a significant decrease in ROG, NOx and CO emissions from motor vehicles. The decrease is largely due to the retirement of older, more polluting automobiles, increases in the number of newer automobiles and increasingly stringent emissions controls on engines and fuels. While projected emissions of particular matter are forecast to increase compared to current conditions, the Transportation 2030 investment plan would produce fewer particulate emissions than the no investment alternative.

Discussion of Data Availability and Quality and of Alternative/Additional Measures

Motor vehicle emissions. Table A referenced in Section 19 of the STIP Guidelines does not list any performance measures of air quality. The measures presented here are from the Transportation 2030 Environmental Impact Report. They are based on travel forecasts from the regional travel demand model and the California Air Resource Board's EMFAC2002 model.

Part 2. 2006 RTIP Contribution

The Bay Area's 2006 RTIP contributes to the regional goal of clean air as follows:

1. The RTIP submittal contains 11 projects totaling $55.8 million that will **contribute toward cleaner air**. (9% of total funds proposed for programming).

Examples:

TIP ID#	Implementing Agency	Description	Total ($1,000)	RTP ID#
BRT990002	BART	BART Oakland Airport Connector	$38,000	21131
CC-030010	Contra Costa	Camino Tassajara Rd Bikeway Shoulders	$324	21855
SCL010020	Sunnyvale	Borregas Ave Bike/Ped Bridges	$3,700	21737
SM-010005	BART	BART SFO Airport Bicycle Trail	$2,120	94101

RTP Goal: Livable Communities

Part 1. Current and Future System Performance

		Current System Performance (2000)	Future System Performance (2030)	
			Transportation 2030 Performance	Compared to No Investment
Additional/ Alternative Measures	Number and share of population within ¼ mile of a rail station	487,100 7.2%	655,900 7.5%	1% (number) no change (%)
	Number and share of population within ¼ mile of a ferry terminal	7,100 0.1%	13,500 0.2%	no change
	Do projects and policies enable community residents to use a wide range of modes to access daily activities?	See qualitative discussion below	See qualitative discussion below	

Source: Metropolitan Transportation Commission analysis

The accessibility measures show a small increase from today to 2030 in the number and share residents within a quarter mile of rail and ferry terminals. This reflects ABAG's Projections 2003 land use assumptions, which are based on "smart growth" principles and focus a larger share of new growth in urban infill opportunity zones and around transit hubs, reflecting efforts to increase accessibility to trunkline transit. Compared to the No Investment Alternative, the Transportation 2030 Plan increases access to rail with several planned rail extensions. The result is a 1% increase in the number of residents within a quarter mile of rail stations.

Transportation 2030 policies and investments are intended to enable community residents to use a wide range of modes to access daily activities. Specific examples include:

- Committing $27 million per year to continue the over-subscribed regional Transportation for Livable Communities program, which supports community-based transportation projects that bring new vibrancy to downtown areas, commercial cores, neighborhoods, and transit corridors, enhancing their amenities and making them places where people want to live, work and visit. MTC regularly evaluates the TLC program.
- Establishing a regional bicycle and pedestrian funding program, to supplement considerable local funding and state Transportation Development Act funding.
- Creating a station area planning grant program to assist with development of specific plans, which will address non-motorized transportation as well as land uses, around planned transit expansion stations.
- Committing to complete community-based transportation plans in low-income and minority communities and encouraging inclusion of recommendations from these efforts in funding program. These plans often identify improvements to transit, pedestrian or cycling facilities to address residents basic mobility needs.

MTC targets flexible federal funding, rather than RTIP funding, as the major source for these targeted livable community efforts. However, the region expects that many RTIP project will have elements that support livable communities as well, for example, by including non-motorized travel elements in capital projects.

Discussion of Data Availability and Quality and of Alternative/Additional Measures

Table A referenced in Section 19 of the STIP Guidelines does not list any performance measures for livable communities. Indeed, the concept encompasses many issues and is a difficult one to measure directly. Since one of MTC's primary livable communities initiatives is promoting transit oriented development (TOD), this report presents again the measure of persons living within ¼ mile of transit, shown above under access. As MTC begins to implement the region's TOD policy adopted this spring, we will be able to report refined performance measures such as the number of transit expansion stations meeting TOD policy population density thresholds, and the number of new housing units planned and permitted that are close to transit stations.

Because a key objective of MTC's livable communities initiatives is enabling residents to use a wide range of modes to access daily activities within their communities, the second measure presented here is a qualitative assessment of regional policies and projects in this respect.

Part 2. 2006 RTIP Contribution

The Bay Area's 2006 RTIP contributes to the regional goal of livable communities as follows:

1. The RTIP submittal contains 14 projects and Transportation Enhancement reserve funding totaling $84.4 million that will **contribute to more livable communities**. (13% of total funds proposed for programming).

Examples:

TIP ID#	Implementing Agency	Description	Total ($1,000)	RTP ID#
SF050030	City of San Francisco	Pedestrian Safety and Access Education Program	$198	94090
ALA990015	Union City	Union City Intermodal Station	$18,794	94012

Return on Investment

* Note that the Transportation 2030 Plan does not include an explicit corresponding goal

Current and Future System Performance

		Current System Performance (year)	Future System Performance (2030)
	Return on Investment		
Additional/ Alternative Measures	User benefits in Transportation 2030 investment plan compared to No Build alternative (value of time savings plus out of pocket cost savings) in 2004$	N/A	$966.6 million
	Incremental annualized capital cost plus annual operating and maintenance cost associated with Transportation 2030 investment plan in 2004$	N/A	$766.5 to $952.5 million
	Benefit to cost ratio	N/A	1.01 to 1.26

Sources: Metropolitan Transportation Commission Analysis

Notes:
User benefits reflect travel time savings and out-of-pocket costs savings only. Does not reflect changes in emissions or injuries and fatalities.
User benefit calculations assume value of time for person trips of $19.58/hour, equal to 74% of the average regional wage rate. Out of vehicle transit time is weighted by a factor of 2.2. Assed value of time for truck trips is $80/hour to reflect driver wages and overhead.
Project sponsors provided limited information on annual operations and maintenance costs. The total reflects MTC staff estimates.
Range in incremental costs reflects different assumptions about discount rates: the low estimate assumes a 4% discount rate to annualize capital costs; the high estimate assumes a 7% discount rate. This also gives rise to the range in the benefit to cost ratio.

Discussion of Data Availability and Quality and of Alternative/Additional Measures

Benefit to Cost Ratio. These analysis results should be viewed with caution for several reasons:

- User benefits reflects only the value of travel time savings and out-of-pocket cost savings (transit fares, bridge tolls, auto operating costs), making this a conservative estimate of benefits. In the future, MTC may consider monetizing emissions reduction. It is also common practice to monetize safety benefits (reductions in injury and fatal collisions); however, there remains considerable debate about appropriate monetary values for reductions in fatal and injury collisions.
- The Transportation 2030 Plan includes over 350 individual projects for which the information on annual operating and maintenance (O&M) costs varies widely. In many cases, project sponsors did not provide annual O&M cost estimates, and where they did, the methodologies appear to differ considerably. MTC has developed tools to estimate incremental O&M costs for transit expansion projects, but has done the same for roadway projects.
- For the two reasons cited above, the benefit cost measure applied at the program or system level is most useful when comparing various investment alternatives with each other. We must view the estimates of absolute benefits and costs with some caution; however, they probably do provide a reasonable gauge of relative benefits and costs when comparing alternative investment strategies.

In general, MTC does not recommend using the benefit cost measure as reported above. It would make more sense to report the benefit cost ratio of the RTP investment alternative

compared to other investment alternatives examined in the RTP environmental impact report (EIR). Unfortunately, benefit-to-cost ratios for other Transportation 2030 EIR alternatives are not presented here because this data does not exist.

Project Level Analysis

For

- **US 101 Marin/Sonoma Narrows HOV**
- **I-580 EB HOV Lanes, Pleasanton – Livermore**
- **SR-24 Caldecott Tunnel Fourth Bore**
- **I-80/I-680/SR-12 Interchange Project**

2006 RTIP
Project Performance Measures Submittal Form

Project Title:	Hwy 101 Marin Sonoma Narrows Hwy 37 to Corona Rd Over-cross in Petaluma southern most element PM 18.3 to 23.0

Transportation 2030 Goal	CTC/Caltrans Performance Indicator	CTC/Caltrans Measure	Current Performance (2004/5)	Future Performance (year)
A Safe and Well Maintained System	***Safety***	• Fatalities/vehicle miles traveled	At least: 0.000 SB and 0.004 NB (1997-2000)	Not available
		• Fatal collisions/ vehicle miles traveled	0.000 SB and 0.004 NB (1997-2000)	Not available
		• Injury collisions/ vehicle miles traveled	0.13 SB and 0.146 NB (1997-2000)	Not available
		• Fatalities/passenger miles	Est 0.00 SB and 0.0032 NB (1997-2000)	Not available
	System Preservation	• Number and percentage of distressed lane miles	0%	Not available
		• Smoothness based on international roughness index (IRI)	90-115 IRI	Not available
Data Source(s)	1. Project study Report Draft Rt 101 from 1.4 km south of Route 37 to 1.5km north of Atherton Ave March 2001 2. 2004 Pavement Condition Inventory, Caltrans Drive Order, District 4, Rte 101 PM 18-28			
Notes on Measures				

Transportation 2030 Goal	CTC/Caltrans Performance Indicator	CTC/Caltrans Measure	Current Performance (2004/5)	Future Performance (year)
A Reliable Commute	***Mobility***	• Passenger hours of delay per year	3110 veh hours(2004)	6248 veh hours (2015 estimated for existing hwy with no new capacity)
		• Average peak period and off-peak period travel time	Petaluma to S Novato 28 min peak – 18 min off peak	Petaluma to S Novato 33 min peak – 19 min off peak
	Accessibility	• Percentage of population within ¼ mile of transit	5,030, which is 9.4% of the City of Novato population	5,624, which is 8.8% of the City of Novato's projected 2030 population
	Reliability	• Travel time variability	Not available	
		• Percent of transit vehicles no more than 5 minutes late	ALL WEEKDAY PEAK PERIOD SERVICE: On-time 52% N =31 Early 26% Late 23% ALL WEEKDAY NON-PEAK SERVICE: On-time 40% N = 20 Early 30% Late 30% ALL WEEKEND SERVICE: On-time 48% N = 42 Early 21% Late 31%	Not available
	Productivity	• Transit passenger per revenue vehicle hour	32.5 passengers per revenue vehicle hour	Not Avail
		• Transit passenger per revenue vehicle mile	1.24 passengers per mile for the 14.75 miles	Not Avail
		• Passenger miles per train mile (commuter rail only)	Not applicable, there is not yet a commuter train	Not Avail

Transportation 2030 Goal	CTC/Caltrans Performance Indicator	CTC/Caltrans Measure	Current Performance (2004/5)	Future Performance (year)
		• Average peak period and daily vehicle trips	Estimated 15,427 Peak Period vehicles and 93,354 daily vehicle trips	Estimated 17,958 Peak Period vehicles and 120,421 daily vehicle trips
		• Average peak period and daily person throughput	Estimated 19,469 peak period person through put – 117,813 daily person through put in both directions	Estimated 22,662 peak period person through put – 151,971 daily person through put in both directions
Data Source(s)	1. MTC Caltrans Bay Area Freeway Locations With Most Delay During Commute Hours, 2004 2. Marin Travel Model ABAG 2003 Year 2005 and 2015, Golden Gate ridership and schedule			
Notes on Measures				
Efficient Freight Travel	***Productivity (trucks)***	• Number of average daily vehicle trips that are trucks	Estimated 4,108 daily truck trips	Estimated 5,300 daily truck trips
		• Percentage of average daily vehicle trips that are trucks	4.4% at the Manuel Freitas weigh station the last six years	4.4% at the Manuel Freitas weigh station the last six years
Data Source(s)	2000 Annual Average Daily Truck Traffic on the California State Highway System, Dec 2001			
Notes on Measures				
-- None --	***Return on Investment***	**Benefit/Cost Ratio**	N/A	1.5
		Return on Investment	N/A	9.5%
Data Source(s)	Caltrans District 4 Staff			
Notes on Measures	Data covers 20-year period			

Other Relevant Project Performance Measures

Use this space to provide other transportation performance measures that describe how the project address the Transportation 2030 Goals. This could include qualitative discussion of measures listed above and/or other quantitative measures used in project development. Copy the boxes below to provide analysis for additional measures and Transportation 2030 Goals as needed. (For example, other Transportation 2030 Goals not listed above include: Access to Mobility, Clean Air, and Livable Communities.)

<table>
<tr><td>Transportation 2030 Goal</td><td>Based on the MTC Caltrans “Bay Area Freeway Locations With Most Delay During Commute Hours, 2004” the Marin Sonoma Narrows is the seventh worst bottleneck in the Bay area Transportation network and projected to increase its travel demand by about 42% over the next ten years. The Regional Transportation Plan 2030 calls for completion of HOT lanes through this area to minimize delays to Bay Area users.</td></tr>
<tr><td>Performance Measure</td><td>The proposed segment currently operates at Level of Service F and has over the last 15 years, which is below the State and Marin, local operations standard. The proposed addition of an HOV lane would at least keep pace with the projected additional traffic and possibly improve operations. Reducing idling cars in the northwestern part of the region are an important air quality benefit to the entire region.</td></tr>
<tr><td>Performance (quantitative or qualitative discussion)</td><td>See immediately above description of the projects benefit to meeting performance criteria and the upper part of the table for a quantified discussion.
<table>
<tr><th></th><th>Date</th><th>Jobs</th><th>Household</th><th>Population</th><th>Date</th><th>Jobs</th><th>Households</th><th>Population</th></tr>
<tr><td>¼ Mile Access</td><td>Existing 2005</td><td>7,448</td><td>2,012</td><td>5,030</td><td>Projected 2030</td><td>14,823</td><td>2,250</td><td>5,624</td></tr>
<tr><td>½ Mile Access</td><td>Existing 2005</td><td>14,444</td><td>68,035</td><td>17,007</td><td>Projected 2030</td><td>22,763</td><td>7,404</td><td>18,511</td></tr>
</table>
</td></tr>
</table>

2006 RTIP
Project Performance Measures Submittal Form

Project Title	I-580 Eastbound HOV Lane Project – Hacienda Drive to Greenville Road

Transportation 2030 Goal	CTC/Caltrans Performance Indicator	CTC/Caltrans Measure	Current Performance (year)[1, 2]	Future Performance (year)[6]
A Safe and Well Maintained System	***Safety***	• Fatalities/vehicle miles traveled	13 [3]	N/A[7]
		• Fatal collisions/ vehicle miles traveled	0.004 [4]	N/A
		• Injury collisions/ vehicle miles traveled	0.25 [5]	N/A[7]
		• Fatalities/passenger miles	N/A	N/A
	System Preservation	• Number and percentage of distressed lane miles	N/A[8]	N/A
		• Smoothness based on international roughness index (IRI)	N/A	N/A
Data Source(s)	Caltrans, Transportation Systems Network, September 200**5**			
Notes on Measures	1. Accident data is not generally looked at on a one-year basis because one year is not considered a statistically significant sample size; three-year analysis periods are typically used. Data provided is for the three-year analysis period January 1, 2002 to December 31, 2004 in both directions of I-580. 2. Caltrans recently made changes to their accident database and are still working out inconsistencies in data requests. Information for eastbound I-580 could not be retrieved at the time of our most recent request in October 2005. Table B accident data for eastbound I-580 could not be retrieved. 3. To the best of our knowledge, Caltrans does not track fatalities / vehicle mile traveled. The number provided represents the number of fatalities in the three-year period analyzed; there were nine accidents involving fatalities with a total of 13 fatalities. 4. Rate is per million vehicle miles traveled and is less than the Statewide average for similar facilities. 5. Rate is per million vehicle miles traveled and includes fatal accidents; the rate is less than the Statewide average for similar facilities. 6. Future Performance Year assumed to be 2030. 7. Exact figures not available, but safety for motorists should improve due to construction of standard inside shoulders and outside auxiliary lanes. Safety for Caltrans maintenance workers should improve since the inside shoulder will be completely paved, therefore reducing the need for maintenance activities 8. SHOPP Information not available at this time. PSSR for I-580 EB pavement Rehab is due out mid-December 2005. Rehab strategy includes crack, seat, and AC overlay of the existing MF lanes.			

Transportation 2030 Goal	CTC/Caltrans Performance Indicator	CTC/Caltrans Measure	Current Performance (year)[1, 2]	Future Performance (year) [6]
A Reliable Commute	***Mobility***	• Passenger hours of delay per year	2,300,000 [12]	N/A
		• Average peak period and off-peak period travel time [7]	Peak Period (Hopyard Rd to Greenville Rd) AM Peak Period (reverse commute) - EB: 10.4 min PM Peak Period – EB: 29.4 min	PM Peak Period (Foothill Road to east of Greenville Road) No-Build Alt: EB 51 minutes Build Alt: EB Mixed-Flow: 38 minutes EB HOV: 18 minutes Off-Peak Period Not Avail
	Accessibility	• Percentage of population within ¼ mile of transit	N/A	N/A
	Reliability	• Travel time variability	N/A	N/A
		• Percent of transit vehicles no more than 5 minutes late	N/A	N/A
	Productivity	• Transit passenger per revenue vehicle hour	N/A	N/A
		• Transit passenger per revenue vehicle mile	N/A	N/A
		• Passenger miles per train mile (commuter rail only)	N/A	N/A
		• Average peak period and daily vehicle trips [9]	Peak Period 28,800 Daily EB - 173,000	Peak Period 43,200 Daily EB - 247,000
		• Average peak period and daily person throughput [9]	Peak Period EB- 32,500 [10] Daily Not Avail	Peak Period EB - 49,200 [11] Daily Not Avail
Data Source(s)	[12] MTC – Annual List of the Bay Area's Top 10 Traffic Hot Spots			

Transportation 2030 Goal	CTC/Caltrans Performance Indicator	CTC/Caltrans Measure	Current Performance (year)[1, 2]	Future Performance (year) [6]
Notes on Measures	[9] Data reported are for eastbound I-580 only. [10] Based upon an estimated peak period average occupancy rate of 1.13, an average hourly forecast volume in the PM peak period of 7,200 vehicles/hour, and a four hour peak period. [11] Based upon an estimated peak period average occupancy rate of 1.14, an average hourly forecast volume in the PM peak period of 10,800 vehicles/hour, and a four hour peak period. I-580 existing conditions analysis for project was performed in 2001-2002; more current "existing conditions" or "current performance" information is not available.			
Efficient Freight Travel	***Productivity (trucks)***	• Number of average daily vehicle trips that are trucks	17,300 – 20,800	24,700 – 29,700
		• Percentage of average daily vehicle trips that are trucks	10-12%	10-12%
Data Source(s)	1. I-580 EB HOV Lane Project: Existing AADT – Caltrans, Annual Average Daily Traffic 2004 2. Forecast AADT – Parsons, May 2005 **3.** Truck Percentages – Caltrans, Annual Average Daily Truck Traffic, 2004			
Notes on Measures	Currently, trucks make up approximately 8 percent of the vehicle mix during the peak period and vary from approximately 10 to 12 percent daily depending upon actual location within the limits of the I-580 EB HOV Lane Project. The same truck percentages are assumed for the 2030 future performance year.			
-- None --	***Return on Investment***	• Return on Investment or Benefit to Cost Ratio	Not Avail	Not Avail.
Data Source(s)				
Notes on Measures				

Other Relevant Project Performance Measures

Use this space to provide other transportation performance measures that describe how the project address the Transportation 2030 Goals. This could include qualitative discussion of measures listed above and/or other quantitative measures used in project development. Copy the boxes below to provide analysis for additional measures and Transportation 2030 Goals as needed. (For example, other Transportation 2030 Goals not listed above include: Access to Mobility, Clean Air, and Livable Communities.)

Transportation 2030 Goal	Clean Air
Performance Measure	Vehicle Emissions & CO Concentration
Performance (quantitative or qualitative discussion)	The I-580 EB HOV Lanes Project would not generate any new vehicle trips and thus would not increase vehicle emissions. Increased average vehicle speeds and less idling as a result of the addition of the HOV lanes will decrease emissions. Generally CO concentrations under the Build Alternative are the same or slightly lower than those under the No-Build Alternative. Nine roadway segments with predicted 2030 LOS of E or F were analyzed for CO with the following results, which do not exceed the state or federal standards: • 1-Hr Concentration: 1.0 ppm to 1.5 ppm • 8-Hr Concentration: 0.6 ppm to 0.9 ppm **Source: Admin. Draft EA/IS, I-580 EB HOV Lane Project, 10/2005**

2006 RTIP
Project Performance Measures Submittal Form

Project Title	CALDECOTT TUNNEL IMPROVEMENT PROJECT, SR-24

Transportation 2030 Goal	CTC/Caltrans Performance Indicator	CTC/Caltrans Measure	Current Performance (year)	Future Performance (year 2032) No Build Only	Future Performance (year 2032) Build 2-lane
A Safe and Well Maintained System	***Safety***	• Fatalities/vehicle miles traveled	0.003	N/A	N/A
		• Fatal collisions/ vehicle miles traveled	0.003	N/A	N/A
		• Injury collisions/ vehicle miles traveled	0.43	N/A	N/A
		• Fatalities/passenger miles	Not available	N/A	N/A
	System Preservation	• Number and percentage of distressed lane miles	Not available	Not available	Not available
		• Smoothness based on international roughness index (IRI)	Not available	Not available	Not available
Data Source(s)					
Notes on Measures					

Transportation 2030 Goal	CTC/Caltrans Performance Indicator	CTC/Caltrans Measure	Current Performance (year)	Future Performance (year 2032) No Build Only	Future Performance (year 2032) Build 2-lane
A Reliable Commute	***Mobility***	• Passenger hours of delay per year	EB AM = 590 veh-hr EB PM = 2470 WB AM = 220 WB PM = 1090 Daily total = 4370 veh-hr per day Year total = 4370 * 250 days/year * 1.2 per/veh = 1,311,500 per-hr/yr	mainline delay only: EB AM = 5767 EB PM = 2898 WB AM = 11999 WB PM = 9059 Delay daily total = 29723 veh-hr per day Delay year total = 29723 * 250* 1.2 = 8,916,900 per-hr/yr	mainline delay only: EB AM = 0 EB PM = 4332 WB AM = 12329 WB PM = 23 Delay daily total = 16684 veh-hr per day Delay year total = 16684 * 250* 1.2 =5,005,200 per-hr/yr
		• Average peak period and off-peak period travel time	EB AM delay 7 min. EB PM delay 10 min. WB AM delay 8 min. WB PM delay 3 min.	EB AM delay 78 min. EB PM delay 12 min. WB AM delay 35 min. WB PM delay 33 min.	EB AM delay 0 min. EB PM delay 13 min. WB AM delay 38 min. WB PM delay 0 min.
	Accessibility	• Percentage of population within ¼ mile of transit	N/A	N/A	N/A
	Reliability	• Travel time variability	N/A	N/A	N/A
		• Percent of transit vehicles no more than 5 minutes late	N/A	N/A	N/A
	Productivity	• Transit passenger per revenue vehicle hour	N/A	N/A	N/A
		• Transit passenger per revenue vehicle mile	N/A	N/A	N/A
		• Passenger miles per train mile (commuter rail only)	N/A	N/A	N/A
		• Average peak period and daily vehicle trips	APT = 44000 for AM peak only (roughly the same for PM peak) ADT = 162000	Not Available	Not Available

Transportation 2030 Goal	CTC/Caltrans Performance Indicator	CTC/Caltrans Measure	Current Performance (year)	Future Performance (year 2032) No Build Only	Future Performance (year 2032) Build 2-lane
		• Average peak period and daily person throughput	APT = 44000 * 1.2 person/veh = 52800 APT = 162000 * 1.2 = 194400	Not Available	Not Available
Data Source(s)					
Notes on Measures					
Efficient Freight Travel	***Productivity (trucks)***	• Number of average daily vehicle trips that are trucks	truck ADT = 3700	Not Available	Not Available
		• Percentage of average daily vehicle trips that are trucks	2.3%	2.3%	2.3%
Data Source(s)					
Notes on Measures					
-- None --	***Return on Investment***	Benefit/Cost Ratio	N/A	N/A	2.8
		Return on Investment	N/A	N/A	12.7%
Data Source(s)	Caltrans District 4 Staff				
Notes on Measures	Data covers 20-year period				

2006 RTIP
Project Performance Measures Submittal Form

Project Title	I-80 / I-680 / SR-12 Interchange Improvement Project

Transportation 2030 Goal	CTC/Caltrans Performance Indicator	CTC/Caltrans Measure	Current Performance (year)	Future Performance (year)
A Safe and Well Maintained System	***Safety***	• Fatalities/vehicle miles traveled	Not Available	Not Available
		• Fatal collisions/ vehicle miles traveled	Not Available	Not Available
		• Injury collisions/ vehicle miles traveled	Not Available	Not Available
		• Fatalities/passenger miles	Not Available	Not Available
	System Preservation	• Number and percentage of distressed lane miles	Not Available	Not Available
		• Smoothness based on international roughness index (IRI)	Not Available	Not Available
Data Source(s)				
Notes on Measures				

Transportation 2030 Goal	CTC/Caltrans Performance Indicator	CTC/Caltrans Measure	Current Performance (year)	Future Performance (year)
A Reliable Commute	***Mobility***	• Passenger hours of delay per year	Not Available	Not Available
		• Average peak period and off-peak period travel time	Not Available	Not Available
		Peak Hour Travel Time Increase (over existing travel times) EB – AM		2%
		Peak Hour Travel Time Increase (over existing travel times) EB – PM		154%
		Peak Hour Travel Time Increase (over existing travel times) WB – AM		71%
		Peak Hour Travel Time Increase (over existing travel times) WB – PM		5%
	Accessibility	• Percentage of population within ¼ mile of transit	N/A	N/A
	Reliability	• Travel time variability	N/A	N/A
		• Percent of transit vehicles no more than 5 minutes late	N/A	N/A
	Productivity	• Transit passenger per revenue vehicle hour	N/A	N/A
		• Transit passenger per revenue vehicle mile	N/A	N/A
		• Passenger miles per train mile (commuter rail only)	N/A	N/A
		• Average peak period and daily vehicle trips		
		Peak Hour Trips EB – AM	5,650	8,220
		Peak Hour Trips EB – PM	8,080	13,590
		Peak Hour Trips WB – AM	8,470	15,414
		Peak Hour Trips WB – PM	6,780	9,711
		Daily Vehicle Trips	215,000	345,000
		• Average peak period and daily person throughput		
		Peak Hour Person Trips EB – AM	6,570	9,560
		Peak Hour Person Trips EB – PM	10,710	20,430
		Peak Hour Person Trips WB – AM	9,850	15,800
		Peak Hour Person Trips WB – PM	8,980	12,870
		Daily Person Trips	261,610	419,800
Data Source(s)	Traffic Operating Conditions for the Expanded Project Area (Fehr and Peers, February 2005). Existing volumes from I-80/I-680/SR-12 Interchange PR/ED Existing Weekday (Tuesday through Thursday) Future volumes from Year 2030 With Project Visum model. Existing Daily Trips from Caltrans 2004 ADT Surveys.			
Notes on Measures	Travel time calculated as an increase over existing travel times			

Transportation 2030 Goal	CTC/Caltrans Performance Indicator	CTC/Caltrans Measure	Current Performance (year)	Future Performance (year)
Efficient Freight Travel	***Productivity (trucks)***	• Number of average daily vehicle trips that are trucks		
		Peak Hour Truck Trips (Total 2-way) – AM	866	1861
		Peak Hour Truck Trips (Total 2-way) – PM	458	986
		• Percentage of average daily vehicle trips that are trucks		
		% Peak Hour Trips EB – AM	7.5%	11.0%
		% Peak Hour Trips EB – PM	3.3%	3.7%
		% Peak Hour Trips WB – AM	5.3%	7.0%
		% Peak Hour Trips WB - PM	2.9%	4.3%
Data Source(s)	Existing and future truck volumes taken from I-80I-680/SR-12 Interchange PR/ED completed to date.			
Notes on Measures				
-- None --	***Return on Investment***	Benefit to Cost Ratio	N/A	3.2
		Return on Investment	N/A	13.5%
Data Source(s)	Caltrans District 4 Staff			
Notes on Measures	Data covers 20-year period			